

PATENT ABSTRACTS OF JAPAN

(11)Publication number : **09-240004**

(43)Date of publication of application : **16.09.1997**

(51)Int.Cl.

B41J 2/175

(21)Application number : **08-079415**

(71)Applicant : **SEIKO EPSON CORP**

(22)Date of filing : **08.03.1996**

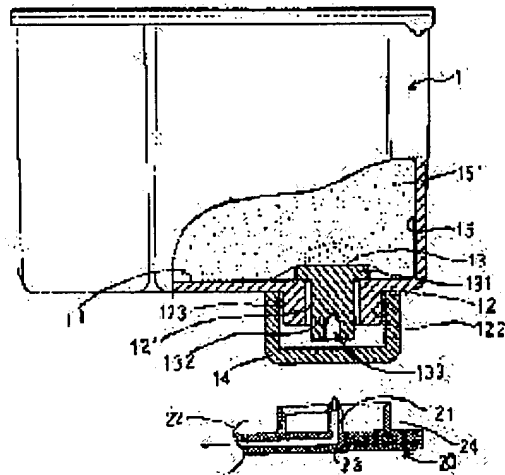
(72)Inventor : **KANETANI MUNEHIDE**

(54) INK TANK AND INK SUPPLY DEVICE FOR INK JET RECORDING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To keep an ink airtight to prevent the ink from evaporating and leaking, and thereby supply the ink efficiently to a printer head and at the same time, make a used ink tank easily recoverable by interposing an O-ring in the outwardly oriented cylindrical part of an ink supply part to fit a cover airtightly.

SOLUTION: An ink supply part 12 is provided at the bottom part 11 of an ink tank 1, and a porous body for connection 13 is fitted into a through hole 121 in the ink supply part 12. In addition, an O-ring 123 is interposed on the outside of an outwardly oriented cylindrical part 122 to engage a cup-like cover 14 encircling the porous part 13 in freely detachable manner. Further, when the ink tank 1 by mounting it on a printer, the cover 14 is detached from the cylindrical part 122 to face the cylindrical part 122 to an ink supply device 20. In addition, an ink supply needle 21 is introduced into a tapered blind hole 133 of the porous body 13, and the



porous body 13 is slightly pushed up by the ink supply needle 21. Thus the ink tank 1 is mounted on a printer.

LEGAL STATUS

[Date of request for examination] 20.04.2001

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number] 3391179

[Date of registration] 24.01.2003

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

*** NOTICES ***

JPO and NCIP are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] In the ink tank which carried out the interior of the form in an ink jet recording device The bore which is open for free passage in the form room which holds said form in the ink feed zone prepared in the one wall is established. As said form is made to face the major diameter of the porous body for connection which consisted of ingredients which have a continuation hole more detailed than said form, it is arranged to the form interior of a room on said wall. The ink tank in the ink jet recording device which the diameter reduction section following the major diameter concerned is fitted [recording device] in free [rise and fall] into said bore, and comes it free to carry out fitting of the attachment and detachment of covering to said ink feed zone.

[Claim 2] The ink tank in the ink jet recording device according to claim 1 which comes to cut a groove in the outer edge of the diameter reduction section of said porous body for connection the taper foramen cecum ossis forntalis which enabled engagement of the supply needle of ink.

[Claim 3] The ink feeder in the ink jet recording device possessing the supply needle which may engage with the porous body for connection which is the ink feeder whose engagement was enabled and was arranged in the ink feed zone of the ink tank in an ink jet recording device free [rise and fall] at the bore of an ink feed zone.

[Claim 4] The ink feeder in the ink jet recording device according to claim 3 constituted so that said supply needle might push up said porous body for connection, might carry out the compression set of the form which carried out interior to said ink tank and might get.

[Claim 5] The ink feeder in the ink jet recording device which arranges and becomes the periphery of the supply needle concerned so that height may be made into size for the connection cylinder which may engage with the porous body for connection which is the ink feeder whose engagement was enabled and was arranged in the ink feed zone of the ink tank in an ink jet recording device free [rise and fall] at the bore of an ink feed zone rather than said supply needle and a supply needle may be made into the letter of seal.

[Claim 6] The ink feeder in the ink jet recording device according to claim 5 constituted so that said connection cylinder might push up said porous body for connection, might carry out the compression set of the form and might get.

[Claim 7] The ink tank in the ink jet recording device according to claim 1 which protruded the outward cylinder part on said ink feed zone.

[Claim 8] The ink feeder in the ink jet recording device according to claim 3 which prepared the peripheral wall which can fit into the outward cylinder part which protruded on said ink feed zone.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention belongs to the ink tank which can supply ink to an ink jet recording device, and the technical field of that ink feeder.

[0002]

[Description of the Prior Art] In the ink tank conventionally equipped with the form which carried out occlusion of the prior ***** ink in this kind of technical field As the configuration of the ink feed zone for supplying ink to the ink head of a printer is shown in drawing 5 and drawing 6 , a rubber seal B is attached in a feed zone A. The opening is closed with the feed hopper film E which consists of laminated films, such as polypropylene (PP) or polyethylene terephthalate (PET). While constituting so that leakage of the ink from the ink tank IT may be prevented carelessly, in the use Said feed hopper film E was broken through with the supply needle F which transmits ink to the head (illustration abbreviation) of a printer, and it fitted in the rubber seal B, and it constituted so that Filter H might be made to penetrate and the ink from Form G might be supplied to a head with the supply needle F concerned.

[0003]

[Problem(s) to be Solved by the Invention] Also in the ink tank of above point **, before-it-happens prevention of evaporation or the leakage can be carried out for ink by the shape of the closure at insurance, and although usefulness was high, in order to reuse a used ink tank, in addition, there was room of an improvement.

[0004] The technical problem which is going to solve the 1st of this invention is offering the ink tank which can be easily reuse-ized by low cost.

[0005] The technical problems which are going to solve the 2nd of this invention are the ink tank which can improve the supply effectiveness of the ink from an ink tank, and offering that feeder.

[0006] The technical problem which is going to solve the 3rd of this invention has simple structure, and is offering an ink feeder without fear of leakage of ink.

[0007]

[Means for Solving the Problem] The following point is mentioned as aforementioned The means for solving a technical problem.

[0008] (1) In the ink tank which carried out the interior of the form in an ink jet recording device The bore which is open for free passage in the form room which holds said form in the ink feed zone prepared in the one wall is established. As said form is made to face the major diameter of the porous body for connection which consisted of ingredients which have a continuation hole more detailed than said form, it is arranged to the form interior of a room on said wall. The ink tank in the ink jet recording device which the diameter reduction section following the major diameter concerned is fitted [recording device] in free [rise and fall] into said bore, and comes it free to carry out fitting of the attachment and detachment of covering to said ink feed zone.

[0009] (2) The above which comes to cut a groove in the outer edge of the diameter reduction section of said porous body for connection the taper foramen cecum ossis forntalis which enabled engagement of the supply needle of ink (1) Ink tank in the ink jet recording device of a publication.

[0010] (3) The ink feeder in the ink jet recording device possessing the supply needle which may engage with the porous body for connection which is the ink feeder whose engagement was

enabled and was arranged in the ink feed zone of the ink tank in an ink jet recording device free [rise and fall] at the bore of an ink feed zone.

[0011] (4) The above constituted so that said supply needle might push up said porous body for connection, might carry out the compression set of the form which carried out interior to said ink tank and might get (3) Ink feeder in the ink jet recording device of a publication.

[0012] (5) The ink feeder in the ink jet recording device which arranges and becomes the periphery of the supply needle concerned so that height may be made into size for the connection cylinder which may engage with the porous body for connection which is the ink feeder whose engagement was enabled and was arranged in the ink feed zone of the ink tank in an ink jet recording device free [rise and fall] at the bore of an ink feed zone rather than said supply needle and a supply needle may be made into the letter of seal.

[0013] (6) The above constituted so that said connection cylinder might push up said porous body for connection, might carry out the compression set of the form and might get (5) Ink feeder in the ink jet recording device of a publication.

[0014] (7) The above which protruded the outward cylinder part on said ink feed zone (1) Ink tank in the ink jet recording device of a publication.

[0015] (8) The above which prepared the peripheral wall which can fit into the outward cylinder part which protruded on said ink feed zone (3) Ink feeder in the ink jet recording device of a publication.

[0016]

[Embodiment of the Invention] Hereafter, the gestalt of implementation of this invention is explained based on a drawing.

[0017] (Gestalt 1 of operation)

** As shown in a block diagram 1 and drawing 2, the ink feed zone 12 is formed in the pars basilaris ossis occipitalis 11 of the ink tank 1, and while fitting in the porous body 13 for connection mentioned later into the bore 121 of the ink feed zone 12 concerned, the outside of the outward cylinder part 122 is made to make free fitting of the attachment and detachment of the covering 14 of the shape of a cup which infixes O ring 123 and surrounds said porous body 13 for connection.

[0018] Moreover, if it sees about said porous body 13 for connection, it will have a filter function. The major diameter 131 from which it consists of ingredients which have detailed continuation pore with an eye finer than the form 151 in the form room 15 of the ink tank 1, and the shape of the appearance is stopped by ***** on said pars basilaris ossis occipitalis 11 by the shape of a major diameter, It has the diameter reduction section 132 ****(ed) by leaving a necessary gap in the bore 121 of said ink feed zone 12, and the taper foramen cecum ossis forntalis 133 which can fit in the supply needle 21 of the ink feeder 20 mentioned later is formed in the heel.

[0019] Moreover, while protruding the supply needle 21 on the base frame 23 which established the ink pilot hole 22 which is open for free passage on the head of a printer about the aforementioned ink feeder 20, the outer-ring-of-spiral-wound-gasket-like peripheral wall 24 which has the inside diameter which can fit into said outward cylinder part 122 at the time of ink supply is arranged in the periphery.

[0020] ** If it is in the intact ink tank 1 as shown in usage drawing 1, since O ring 123 is infixed in the outward cylinder part 122 of the ink feed zone 12 and covering 14 is fitted in in the shape of seal, ink is held in the shape of an airtight in the ink tank 1.

[0021] In case printer loading is carried out and the ink tank 1 concerned is used After making

covering 14 secede from the outward cylinder part 122 of the ink feed zone 12, make the ink feeder 20 attend and the supply needle 21 is made to insert in the taper foramen cecum ossis forntalis 133 of the porous body 13 for connection. Further It is what loads a printer with the ink tank 1 as pushes up the porous body 13 for connection slightly with the supply needle 21 concerned. By this loading actuation, by the top face of the major diameter 131 of the porous body 13 for connection form 151 It will be pushed up and the capillary tube force in the form 151 in the compressed field concerned is reinforced as a result. Since ink is smoothly transported in the porous body 13 direction for connection and the porous body 13 for connection concerned moreover consists of ingredients with an eye finer than form 151, Ink is further accelerated and transported to porous body 13 inboard for connection, and from the supply needle 21, it is smoothly transported in the direction of a head via said ink pilot hole 22, and it deals in it. [0022] Moreover, in this case, since fitting of the peripheral wall 24 of the ink feeder 20 is carried out to the outward cylinder part 122 of the ink feed zone 12, it can prevent leakage of ink safely.

[0023] In addition, whenever it was flexible, when said porous body 13 for connection consists of high ingredients which they are in comparison, it is not necessarily a thing needless to say that said taper foramen cecum ossis forntalis 133 is not required.

[0024] ** About the ink tank 1 by which ink was consumed by actuation of the regeneration above, after making it secede from the ink feeder 20, covering 14 is made to fit in the outward cylinder part 122 of the ink feed zone 12 again, and it can regenerate easily by being re-filled up with ink in the ink tank 1.

[0025] (Gestalt 2 of operation)

** The thing of the gestalt 2 of operation shown in a block diagram 3 and drawing 4 is made little [the point which is different from the gestalt 1 of said operation / the die length of diameter reduction section 132A of porous body 13A for connection] in comparison, it is the point which infixed seal ring 25A in the periphery of supply needle 21A of ink feeder 20A, and attached connection cylinder 26A removable, and the other point is common in the gestalt 1 of operation.

[0026] In addition, filter 26B is desirably formed in connection cylinder 26A.

[0027] ** Although there is porous body 13A for connection in the shape of non-contact about supply needle 21A as shown in drawing 4 if it is at the time of usage use, instead, connection cylinder 26A pushes up porous body 13A for connection, and can transport ink to a head.

[0028] ** Since it is common in the gestalt 1 of regeneration implementation, omit.

[0029]

[Effect of the Invention] According to this invention explained above, the following effectiveness is expectable.

[0030] ** A used ink tank can be regenerated easily.

[0031] ** The ink in an ink tank can be efficiently supplied to a printer head.

[0032] ** As ink leakage does not occur, ink can be supplied to insurance from an ink tank at a printer.

TECHNICAL FIELD

[Field of the Invention] This invention belongs to the ink tank which can supply ink to an ink jet recording device, and the technical field of that ink feeder.

PRIOR ART

[Description of the Prior Art] In the ink tank conventionally equipped with the form which carried out occlusion of the prior ***** ink in this kind of technical field As the configuration of the ink feed zone for supplying ink to the ink head of a printer is shown in drawing 5 and drawing 6 , a rubber seal B is attached in a feed zone A. The opening is closed with the feed hopper film E which consists of laminated films, such as polypropylene (PP) or polyethylene terephthalate (PET). While constituting so that leakage of the ink from the ink tank IT may be prevented carelessly, in the use Said feed hopper film E was broken through with the supply needle F which transmits ink to the head (illustration abbreviation) of a printer, and it fitted in the rubber seal B, and it constituted so that Filter H might be made to penetrate and the ink from Form G might be supplied to a head with the supply needle F concerned.

EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention explained above, the following effectiveness is expectable.

[0030] ** A used ink tank can be regenerated easily.

[0031] ** The ink in an ink tank can be efficiently supplied to a printer head.

[0032] ** As ink leakage does not occur, ink can be supplied to insurance from an ink tank at a printer.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Also in the ink tank of above point **, before-it-happens prevention of evaporation or the leakage can be carried out for ink by the shape of the closure at insurance, and although usefulness was high, in order to reuse a used ink tank, in addition, there was room of an improvement.

[0004] The technical problem which is going to solve the 1st of this invention is offering the ink tank which can be easily reuse-ized by low cost.

[0005] The technical problems which are going to solve the 2nd of this invention are the ink tank which can improve the supply effectiveness of the ink from an ink tank, and offering that feeder.

[0006] The technical problem which is going to solve the 3rd of this invention has simple structure, and is offering an ink feeder without fear of leakage of ink.

MEANS

[Means for Solving the Problem] The following point is mentioned as aforementioned The means for solving a technical problem.

[0008] (1) In the ink tank which carried out the interior of the form in an ink jet recording device The bore which is open for free passage in the form room which holds said form in the ink feed zone prepared in the one wall is established. As said form is made to face the major diameter of the porous body for connection which consisted of ingredients which have a continuation hole more detailed than said form, it is arranged to the form interior of a room on said wall. The ink tank in the ink jet recording device which the diameter reduction section following the major diameter concerned is fitted [recording device] in free [rise and fall] into said bore, and comes it free to carry out fitting of the attachment and detachment of covering to said ink feed zone.

[0009] (2) The above which comes to cut a groove in the outer edge of the diameter reduction section of said porous body for connection the taper foramen cecum ossis forntalis which enabled engagement of the supply needle of ink (1) Ink tank in the ink jet recording device of a publication.

[0010] (3) The ink feeder in the ink jet recording device possessing the supply needle which may engage with the porous body for connection which is the ink feeder whose engagement was enabled and was arranged in the ink feed zone of the ink tank in an ink jet recording device free [rise and fall] at the bore of an ink feed zone.

[0011] (4) The above constituted so that said supply needle might push up said porous body for connection, might carry out the compression set of the form which carried out interior to said ink tank and might get (3) Ink feeder in the ink jet recording device of a publication.

[0012] (5) The ink feeder in the ink jet recording device which arranges and becomes the periphery of the supply needle concerned so that height may be made into size for the connection cylinder which may engage with the porous body for connection which is the ink feeder whose engagement was enabled and was arranged in the ink feed zone of the ink tank in an ink jet recording device free [rise and fall] at the bore of an ink feed zone rather than said supply needle and a supply needle may be made into the letter of seal.

[0013] (6) The above constituted so that said connection cylinder might push up said porous body for connection, might carry out the compression set of the form and might get (5) Ink feeder in the ink jet recording device of a publication.

[0014] (7) The above which protruded the outward cylinder part on said ink feed zone (1) Ink tank in the ink jet recording device of a publication.

[0015] (8) The above which prepared the peripheral wall which can fit into the outward cylinder part which protruded on said ink feed zone (3) Ink feeder in the ink jet recording device of a publication.

[0016]

[Embodiment of the Invention] Hereafter, the gestalt of implementation of this invention is explained based on a drawing.

[0017] (Gestalt 1 of operation)

** As shown in a block diagram 1 and drawing 2 , the ink feed zone 12 is formed in the pars basilaris ossis occipitalis 11 of the ink tank 1, and while fitting in the porous body 13 for connection mentioned later into the bore 121 of the ink feed zone 12 concerned, the outside of the outward cylinder part 122 is made to make free fitting of the attachment and detachment of

the covering 14 of the shape of a cup which infixes O ring 123 and surrounds said porous body 13 for connection.

[0018] Moreover, if it sees about said porous body 13 for connection, it will have a filter function. The major diameter 131 from which it consists of ingredients which have detailed continuation pore with an eye finer than the form 151 in the form room 15 of the ink tank 1, and the shape of the appearance is stopped by ***** on said pars basilaris ossis occipitalis 11 by the shape of a major diameter, It has the diameter reduction section 132 ****(ed) by leaving a necessary gap in the bore 121 of said ink feed zone 12, and the taper foramen cecum ossis forntalis 133 which can fit in the supply needle 21 of the ink feeder 20 mentioned later is formed in the heel.

[0019] Moreover, while protruding the supply needle 21 on the base frame 23 which established the ink pilot hole 22 which is open for free passage on the head of a printer about the aforementioned ink feeder 20, the outer-ring-of-spiral-wound-gasket-like peripheral wall 24 which has the inside diameter which can fit into said outward cylinder part 122 at the time of ink supply is arranged in the periphery.

[0020] ** If it is in the intact ink tank 1 as shown in usage drawing 1 , since O ring 123 is infixed in the outward cylinder part 122 of the ink feed zone 12 and covering 14 is fitted in in the shape of seal, ink is held in the shape of an airtight in the ink tank 1.

[0021] In case printer loading is carried out and the ink tank 1 concerned is used After making covering 14 secede from the outward cylinder part 122 of the ink feed zone 12, make the ink feeder 20 attend and the supply needle 21 is made to insert in the taper foramen cecum ossis forntalis 133 of the porous body 13 for connection. Further It is what loads a printer with the ink tank 1 as pushes up the porous body 13 for connection slightly with the supply needle 21 concerned. By this loading actuation, by the top face of the major diameter 131 of the porous body 13 for connection form 151 It will be pushed up and the capillary tube force in the form 151 in the compressed field concerned is reinforced as a result. Since ink is smoothly transported in the porous body 13 direction for connection and the porous body 13 for connection concerned moreover consists of ingredients with an eye finer than form 151, Ink is further accelerated and transported to porous body 13 inboard for connection, and from the supply needle 21, it is smoothly transported in the direction of a head via said ink pilot hole 22, and it deals in it.

[0022] Moreover, in this case, since fitting of the peripheral wall 24 of the ink feeder 20 is carried out to the outward cylinder part 122 of the ink feed zone 12, it can prevent leakage of ink safely.

[0023] In addition, whenever it was flexible, when said porous body 13 for connection consists of high ingredients which they are in comparison, it is not necessarily a thing needless to say that said taper foramen cecum ossis forntalis 133 is not required.

[0024] ** About the ink tank 1 by which ink was consumed by actuation of the regeneration above, after making it secede from the ink feeder 20, covering 14 is made to fit in the outward cylinder part 122 of the ink feed zone 12 again, and it can regenerate easily by being re-filled up with ink in the ink tank 1.

[0025] (Gestalt 2 of operation)

** The thing of the gestalt 2 of operation shown in a block diagram 3 and drawing 4 is made little [the point which is different from the gestalt 1 of said operation / the die length of diameter reduction section 132A of porous body 13A for connection] in comparison, it is the point which infixed seal ring 25A in the periphery of supply needle 21A of ink feeder 20A, and attached connection cylinder 26A removable, and the other point is common in the gestalt 1 of operation.

[0026] In addition, filter 26B is desirably formed in connection cylinder 26A.

[0027] ** Although there is porous body 13A for connection in the shape of non-contact about supply needle 21A as shown in drawing 4 if it is at the time of usage use, instead, connection cylinder 26A pushes up porous body 13A for connection, and can transport ink to a head.

[0028] ** Since it is common in the gestalt 1 of regeneration implementation, omit.

[0029]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The ink tank of the gestalt 1 of operation and an ink feeder are a vertical section side elevation a part.

[Drawing 2] The explanatory view of the busy condition of drawing 1 .

[Drawing 3] The ink tank of the gestalt 2 of operation and an ink feeder are a vertical section side elevation a part.

[Drawing 4] The explanatory view of the busy condition of drawing 3 .

[Drawing 5] The ink tank in the conventional technique and an ink supply means are a vertical section side elevation a part.

[Drawing 6] The enlarged drawing of the important section of drawing 5 .

[Description of Notations]

1 Ink Tank

11 Pars Basilaris Osis Occipitalis

12 Ink Feed Zone

121 Bore

122 Outward Cylinder Part

13 13A Porous body for connection

131 Major Diameter

132 132A Diameter reduction section

133 Taper Foramen Cecum Osis Forntalis

14 Covering

15 Form Room

151 Form

20 20A Ink feeder

21 21A Supply needle

24 Peripheral Wall

25A Seal ring

26A Connection cylinder

(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開平9-240004

(43) 公開日 平成9年(1997)9月16日

(51) Int.Cl.⁶

B 4 1 J 2/175

識別記号

庁内整理番号

F I

B 4 1 J 3/04

技術表示箇所

1 0 2 Z

審査請求 未請求 請求項の数8 F D (全 5 頁)

(21) 出願番号 特願平8-79415

(22) 出願日 平成8年(1996)3月8日

(71) 出願人 000002369

セイコーエプソン株式会社

東京都新宿区西新宿2丁目4番1号

(72) 発明者 金 谷 宗 秀

長野県諏訪市大和3丁目3番5号 セイコ

ーエプソン株式会社内

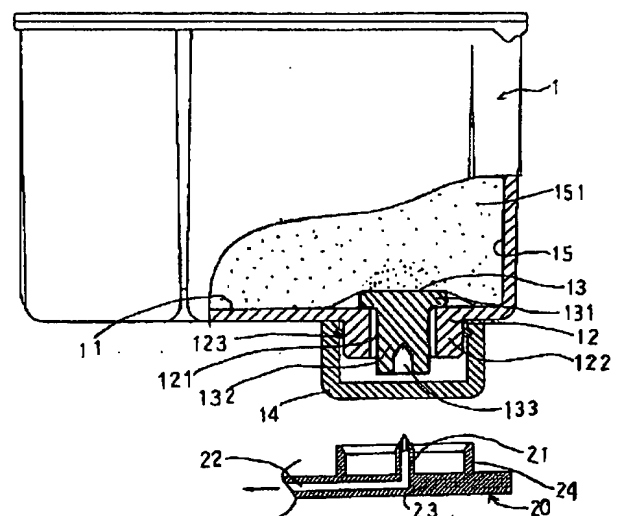
(74) 代理人 弁理士 岡田 和喜

(54) 【発明の名称】 インクジェット記録装置におけるインクタンクとインク供給装置

(57) 【要約】

【課題】 再生利用可能なインクタンクと、インクタンクから効率的にインクをヘッドに供給しうるインク供給装置の提供。

【解決手段】 インクタンクの底部に設けたインク供給部には、外向き筒部を突設すると共に、フォームを収容するフォーム室に連通する透孔を開設し、フォームよりも微細な連続孔を有する材料で構成された接続用多孔質体の大径部をフォームに臨ませるようにして底部上のフォーム室内に配置し、大径部に続く縮径部を透孔内に昇降自在に嵌挿し、外向き筒部にはカバーを着脱自在に嵌合させ、縮径部の外端には、インクの供給針に係合可能とした先細盲孔を凹設したインクタンクと、接続用多孔質体に係合しうる供給針、又は接続筒と、インク供給部の外向き筒部に嵌合しうる周壁とを具備したインク供給装置。



【特許請求の範囲】

【請求項 1】 インクジェット記録装置におけるフォームを内装したインクタンクにおいて、その一つの壁に設けたインク供給部に前記フォームを収容するフォーム室に連通する透孔を開設し、前記フォームよりも微細な連続孔を有する材料で構成された接続用多孔質体の大径部を前記フォームに臨ませるようにして前記壁上のフォーム室内に配置し、当該大径部に続く縮径部を前記透孔内に昇降自在に嵌挿し、前記インク供給部にはカバーを着脱自在に嵌合させてなるインクジェット記録装置におけるインクタンク。

【請求項 2】 前記接続用多孔質体の縮径部の外端には、インクの供給針に係合可能とした先細盲孔を凹設してなる請求項 1 記載のインクジェット記録装置におけるインクタンク。

【請求項 3】 インクジェット記録装置におけるインクタンクのインク供給部に係合可能としたインク供給装置であって、インク供給部の透孔に昇降自在に配設した接続用多孔質体に係合しうる供給針を具備したインクジェット記録装置におけるインク供給装置。

【請求項 4】 前記供給針が、前記接続用多孔質体を押し上げ、前記インクタンクに内装したフォームを圧縮変形させるように構成された請求項 3 記載のインクジェット記録装置におけるインク供給装置。

【請求項 5】 インクジェット記録装置におけるインクタンクのインク供給部に係合可能としたインク供給装置であって、インク供給部の透孔に昇降自在に配設した接続用多孔質体に係合しうる接続筒を、前記供給針よりも高さを大とし、供給針を密封状とするように当該供給針の外周に配備してなるインクジェット記録装置におけるインク供給装置。

【請求項 6】 前記接続筒が、前記接続用多孔質体を押し上げ、フォームを圧縮変形させるように構成された請求項 5 記載のインクジェット記録装置におけるインク供給装置。

【請求項 7】 前記インク供給部に外向き筒部を突設した請求項 1 記載のインクジェット記録装置におけるインクタンク。

【請求項 8】 前記インク供給部に突設した外向き筒部に嵌合しうる周壁を設けた請求項 3 記載のインクジェット記録装置におけるインク供給装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】この発明は、インクジェット記録装置にインクを供給しうるインクタンクと、そのインク供給装置の技術分野に属するものである。

【0002】

【従来の技術】従来、この種の技術分野において、先願におけるインクを吸蔵したフォームを備えたインクタンクにおいて、プリンタのインクヘッドにインクを供給す

るためのインク供給部の構成については図 5 及び図 6 に示す如くに供給部 A 内にゴムシール B を嵌着し、その開口部をポリプロピレン (PP) もしくはポリエチレンテレフタレート (PET) などの積層フィルムからなる供給口フィルム E によって封止し、不用意にインクタンク I T からのインクの漏洩を防止するように構成すると共に、その使用に当たっては、プリンタのヘッド (図示略) ヘインクを転送する供給針 F により前記供給口フィルム E を突き破ってゴムシール B に嵌挿し、フォーム G からのインクをフィルター H を透過させて当該供給針 F によりヘッドに供給するように構成していた。

【0003】

【発明が解決しようとする課題】前記の先願のインクタンクにおいても、インクを封止状で蒸発もしくは漏洩を安全に未然防止しうるもので有用性が高いものであったが使用済みのインクタンクを再利用するためには尚改善の余地があった。

【0004】この発明の第 1 の解決しようとする課題は、低コストで容易に再利用化しうるインクタンクを提供することである。

【0005】この発明の第 2 の解決しようとする課題は、インクタンクからのインクの供給効率を向上することが出来るインクタンクと、その供給装置を提供することである。

【0006】この発明の第 3 の解決しようとする課題は、構造が単純でインクの漏洩のおそれのないインク供給装置を提供することである。

【0007】

【課題を解決するための手段】前記の課題を解決するための手段としては、次の点が挙げられる。

【0008】(1) インクジェット記録装置におけるフォームを内装したインクタンクにおいて、その一つの壁に設けたインク供給部に前記フォームを収容するフォーム室に連通する透孔を開設し、前記フォームよりも微細な連続孔を有する材料で構成された接続用多孔質体の大径部を前記フォームに臨ませるようにして前記壁上のフォーム室内に配置し、当該大径部に続く縮径部を前記透孔内に昇降自在に嵌挿し、前記インク供給部にはカバーを着脱自在に嵌合させてなるインクジェット記録装置におけるインクタンク。

【0009】(2) 前記接続用多孔質体の縮径部の外端には、インクの供給針に係合可能とした先細盲孔を凹設してなる前記(1) 記載のインクジェット記録装置におけるインクタンク。

【0010】(3) インクジェット記録装置におけるインクタンクのインク供給部に係合可能としたインク供給装置であって、インク供給部の透孔に昇降自在に配設した接続用多孔質体に係合しうる供給針を具備したインクジェット記録装置におけるインク供給装置。

【0011】(4) 前記供給針が、前記接続用多孔質体を

押し上げ、前記インクタンクに内装したフォームを圧縮変形させようように構成された前記(3)記載のインクジェット記録装置におけるインク供給装置。

【0012】(5) インクジェット記録装置におけるインクタンクのインク供給部に係合可能としたインク供給装置であって、インク供給部の透孔に昇降自在に配設した接続用多孔質体に係合しうる接続筒を、前記供給針よりも高さを大とし、供給針を密封状とするように当該供給針の外周に配備してなるインクジェット記録装置におけるインク供給装置。

【0013】(6) 前記接続筒が、前記接続用多孔質体を押し上げ、フォームを圧縮変形させようように構成された前記(5)記載のインクジェット記録装置におけるインク供給装置。

【0014】(7) 前記インク供給部に外向き筒部を突設した前記(1)記載のインクジェット記録装置におけるインクタンク。

【0015】(8) 前記インク供給部に突設した外向き筒部に嵌合しうる周壁を設けた前記(3)記載のインクジェット記録装置におけるインク供給装置。

【0016】

【発明の実施の形態】以下、図面に基づいて、この発明の実施の形態を説明する。

【0017】(実施の形態1)

① 構成

図1及び図2に示すようにインクタンク1の底部11にはインク供給部12を設け、当該インク供給部12の透孔121内には後述する接続用多孔質体13を嵌挿すると共に、その外向き筒部122の外側には、Oーリング123を介装して前記接続用多孔質体13を包囲するカップ状のカバー14を着脱自在に嵌合させている。

【0018】又、前記接続用多孔質体13についてみれば、フィルター機能を備え、インクタンク1のフォーム室15内のフォーム151よりも目が細かい微細連続気孔を有する材料で構成され、その外形状は大径状で前記底部11上に接脱自在に係止される大径部131と、前記インク供給部12の透孔121内に所要の間隙を残して透挿される縮径部132とを備えており、その外端部には後述するインク供給装置20の供給針21を嵌挿しうる先細盲孔133を形成したものである。

【0019】又、前記のインク供給装置20についてはプリンタのヘッドに連通するインク導孔22を開設した基枠23上に供給針21を突設すると共に、その外周には、インク供給時に前記外向き筒部122に嵌合可能な内径寸法を有する外輪状の周壁24を配設したものである。

【0020】② 使用法

図1に示すように未使用のインクタンク1にあっては、インク供給部12の外向き筒部122には、Oーリング123を介装してカバー14が密封状に嵌装されている

ため、インクはインクタンク1内に気密状に保持されるものである。

【0021】当該インクタンク1をプリンタ装填して利用する際には、カバー14をインク供給部12の外向き筒部122から離脱させた後、インク供給装置20に臨ませ、供給針21を接続用多孔質体13の先細盲孔133に挿入させ、更には、当該供給針21により接続用多孔質体13を僅かに押し上げるようにしてインクタンク1をプリンタに装填するものであり、この装填操作によって接続用多孔質体13の大径部131の頂面によってフォーム151は、押し上げられることとなり、結果的に当該圧縮された領域でのフォーム151における毛细管力は増強され、インクは円滑に接続用多孔質体13方向に移送され、しかも当該接続用多孔質体13はフォーム151よりも目が細かい材料で構成されているため、インクは更に接続用多孔質体13内方向に増速されて移送され、供給針21より前記インク導孔22を経由してヘッド方向に円滑に移送されうるものである。

【0022】又、この際、インク供給装置20の周壁24はインク供給部12の外向き筒部122に嵌合されているためインクの漏洩は安全に防止しうるものである。

【0023】尚、前記接続用多孔質体13が比較的に柔軟度の高い材料で構成された場合には必ずしも前記先細盲孔133は必要でないことは言うまでもないことである。

【0024】③ 再生処理

前記の操作によってインクが消費されたインクタンク1については、インク供給装置20から離脱させた後、インク供給部12の外向き筒部122に再びカバー14を嵌装させ、インクタンク1内にはインクを再充填することによって容易に再生処理しうるものである。

【0025】(実施の形態2)

① 構成

図3及び図4に示す実施の形態2のものが、前記実施の形態1と相違している点は、接続用多孔質体13Aの縮径部132Aの長さが比較的に短小とされており、インク供給装置20Aの供給針21Aの外周にはシールリング25Aを介装して接続筒26Aを着脱可能に付設した点であって、それ以外の点は実施の形態1と共通している。

【0026】なお、接続筒26Aには望ましくはフィルタ26Bが形成されている。

【0027】② 使用法

使用時にあっては、図4に示すように供給針21Aについては接続用多孔質体13Aとは非接触状にあるが、代わりに接続筒26Aが接続用多孔質体13Aを押し上げてインクをヘッドへ移送しうるものである。

【0028】③ 再生処理

実施の形態1と共通しているので省略する。

【0029】

【発明の効果】以上説明したこの発明によれば、次のような効果を期待出来るものである。

【0030】① 使用済みのインクタンクを容易に再生処理しうるものである。

【0031】② インクタンク内のインクを効率的にプリンタヘッドに供給しうるものである。

【0032】③ インク漏れが発生しないようにして安全にインクタンクからプリンタにインクを供給しうるものである。

【図面の簡単な説明】

【図1】実施の形態1のインクタンクとインク供給装置の一部縦断側面図。

【図2】図1の使用状態の説明図。

【図3】実施の形態2のインクタンクとインク供給装置の一部縦断側面図。

【図4】図3の使用状態の説明図。

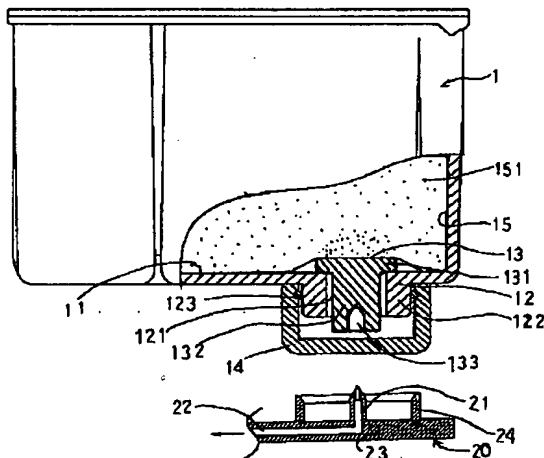
【図5】従来技術におけるインクタンクとインク供給手段の一部縦断側面図。

【図6】図5の要部の拡大図。

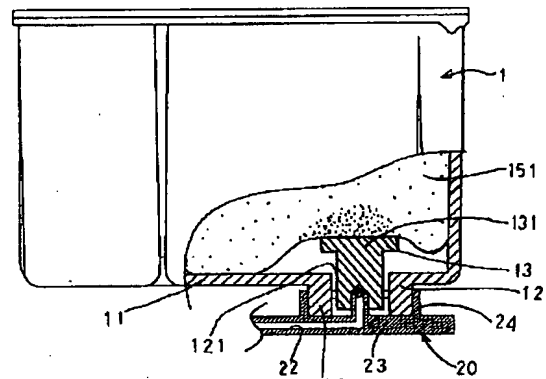
【符号の説明】

1	インクタンク
11	底部
12	インク供給部
121	透孔
122	外向き筒部
13、13A	接続用多孔質体
131	大径部
132、132A	縮径部
133	先細盲孔
14	カバー
15	フォーム室
151	フォーム
20、20A	インク供給装置
21、21A	供給針
24	周壁
25A	シールリング
26A	接続筒

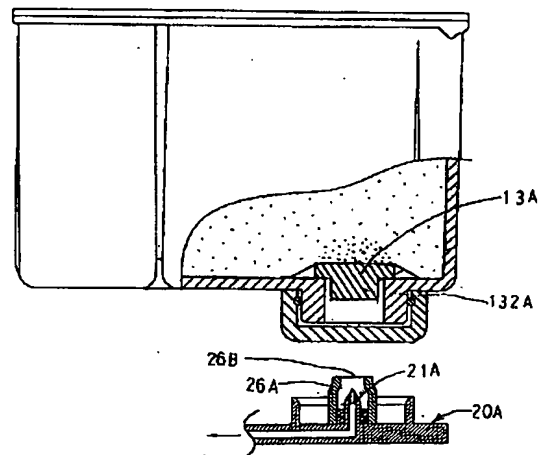
【図1】



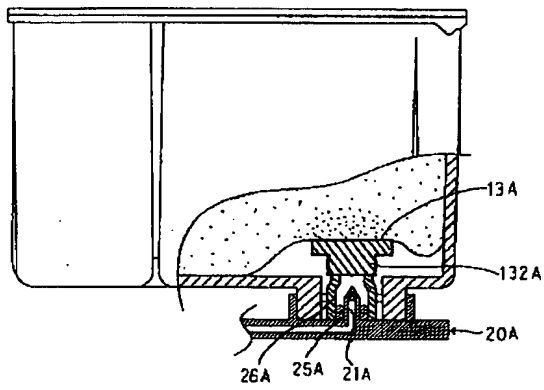
【図2】



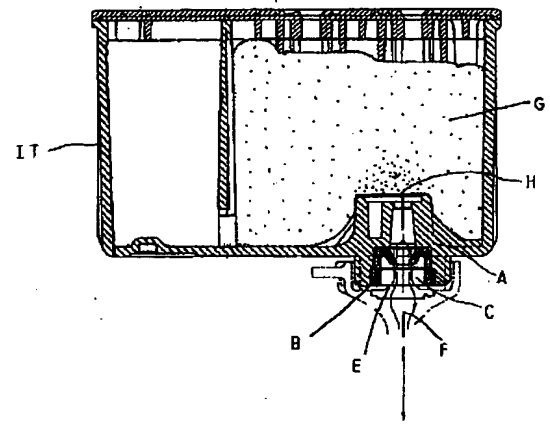
【図3】



【図 4】



【図 5】



【図 6】

